

NUCLEAR POLLUTION IN THE ARCTIC: THE NEXT CHERNOBYL?



NOVEMBER 15, 2016

**Briefing of the
Commission on Security and Cooperation in Europe**

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The Helsinki process, formally titled the Conference on Security and Cooperation in Europe, traces its origin to the signing of the Helsinki Final Act in Finland on August 1, 1975, by the leaders of 33 European countries, the United States and Canada. As of January 1, 1995, the Helsinki process was renamed the Organization for Security and Cooperation in Europe (OSCE). The membership of the OSCE has expanded to 56 participating States, reflecting the breakup of the Soviet Union, Czechoslovakia, and Yugoslavia.

The OSCE Secretariat is in Vienna, Austria, where weekly meetings of the participating States' permanent representatives are held. In addition, specialized seminars and meetings are convened in various locations. Periodic consultations are held among Senior Officials, Ministers and Heads of State or Government.

Although the OSCE continues to engage in standard setting in the fields of military security, economic and environmental cooperation, and human rights and humanitarian concerns, the Organization is primarily focused on initiatives designed to prevent, manage and resolve conflict within and among the participating States. The Organization deploys numerous missions and field activities located in Southeastern and Eastern Europe, the Caucasus, and Central Asia. The website of the OSCE is: <www.osce.org>.

ABOUT THE COMMISSION ON SECURITY AND COOPERATION IN EUROPE

The Commission on Security and Cooperation in Europe, also known as the Helsinki Commission, is a U.S. Government agency created in 1976 to monitor and encourage compliance by the participating States with their OSCE commitments, with a particular emphasis on human rights.

The Commission consists of nine members from the United States Senate, nine members from the House of Representatives, and one member each from the Departments of State, Defense and Commerce. The positions of Chair and Co-Chair rotate between the Senate and House every two years, when a new Congress convenes. A professional staff assists the Commissioners in their work.

In fulfilling its mandate, the Commission gathers and disseminates relevant information to the U.S. Congress and the public by convening hearings, issuing reports that reflect the views of Members of the Commission and/or its staff, and providing details about the activities of the Helsinki process and developments in OSCE participating States.

The Commission also contributes to the formulation and execution of U.S. policy regarding the OSCE, including through Member and staff participation on U.S. Delegations to OSCE meetings. Members of the Commission have regular contact with parliamentarians, government officials, representatives of non-governmental organizations, and private individuals from participating States. The website of the Commission is: <www.csce.gov>.

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Commission on Security and Cooperation in Europe Washington, DC

The briefing was held at 3:30 p.m. in room 2325, Rayburn House Office Building, Washington, DC, A. Paul Massaro III, Policy Advisor, Commission on Security and Cooperation in Europe, moderating.

Panelists present: A. Paul Massaro III, Policy Advisor, Commission on Security and Cooperation in Europe; Nils Bohmer, Managing Director, Bellona Foundation; Julia Gourley, U.S. Senior Arctic Official, Department of State; and Jon Rahbek-Clemmensen, Visiting Fellow, Europe Program, Center for Strategic and International Studies.

Mr. MASSARO. Good afternoon, ladies and gentlemen. Thank you all for coming today. Welcome to today's briefing on nuclear pollution in the Arctic. My name is Paul Massaro, and I'm a policy adviser responsible for economic and environmental issues at the Helsinki Commission.

Although the headlines have been occupied with other matters as of late, the issue of nuclear pollution remains highly topical. Just last week, a diver off the coast of Canada may have discovered a nuclear weapon lost by the United States in 1950. Even though it appears this weapon is likely not a threat, it highlights the continued relevance of the issue, especially in the Arctic, where the concentration of nuclear material is significant.

While the Arctic has in recent years received greater attention on the Hill, the issue of Arctic nuclear pollution has been noticeably less present. At today's briefing, we hope to gauge the level of danger associated with this threat, as well as examine the interests of the United States, Russia and other Arctic Council nations towards the region. Ideally, we will come away with a better understanding of what needs to be done in order to mitigate any potential environmental damage to the Arctic and beyond.

We are grateful to have such distinguished panelists with us here today. Not only do they offer a diversity of subject area expertise on the Arctic, but they are from three separate Arctic Council nations, hailing from Norway, the United States and Denmark, respectively.

First we have Nils Bohmer all the way from Oslo, Norway to be with us today. Mr. Bohmer is the managing director of the Bellona Foundation, a nongovernmental organiza-

tion with offices in Norway, Russia and Belgium that focuses on Arctic environmental issues. As a nuclear physicist, Mr. Bohmer is Bellona's resident expert on radioactive waste, nuclear accidents and nuclear power.

Next we have Julia Gourley, who, in her capacity as U.S. Senior Arctic Official at the State Department, serves as the primary U.S. representative to the Arctic Council. Ms. Gourley is responsible for a wide range of environmental, economic and political issues related to U.S. foreign policy interests in the Arctic. With the United States holding the chairmanship of the Arctic Council in 2016, she has undoubtedly had a very busy year.

Finally, Jon Rahbek-Clemmensen joins us from CSIS's Europe program, where he is currently a visiting fellow. Mr. Rahbek-Clemmensen is also an assistant professor of political science at the University of Southern Denmark and is an expert on Arctic governance and geopolitics.

I'd like now to give the floor to our panelists. Mr. Bohmer, if you would please start us off. I know the Bellona Foundation has been a leader on this subject, so I think we could all benefit enormously from hearing your insight on the current state of play and recommendations moving forward.

Mr. BOHMER. Thank you, Paul.

My name is Nils Bohmer. I am the nuclear physicist and also the general manager of the Bellona Foundation. I have been working with nuclear waste issues in Russia since 1993, so it's been a couple of decades with interesting times.

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The Bellona Foundation has an office in Murmansk, open since 1994. A colleague of mine, Mr. Alexander Nikitin, was arrested and threatened with espionage back in 1995 because of a report we wrote about the Russian Northern Fleet. All of the information was taken from open sources. And, after a five-year-long legal battle, he was totally acquitted in the Russian Supreme Court back in 2000. And that has made us quite recognized in Russia.

And I think also the reports that we have written about the subject, especially in the 1990s, were very factual-based, and were also given a lot of credit by the Russian side; we were not only criticizing, but also documenting facts, and using those reports to create international attention, which has led to a lot of economic support to the cleanup that has been going on in that area over the latest decades.

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Also, our focus has been, since we are relatively close to Russia, it has also been very important for us to be on the ground in Russia—not only to look at satellite photos or Google maps, reading reports from Russia, but it's important for us to be on the ground to learn what is happening there.

Russia has, among other things, 10 nuclear power plants, mostly in the western part of Russia. They have their nuclear weapons complex in the middle of Siberia—Mayak, Seversk and Zelenogorsk. And they also have an Arctic presence, mainly with their nuclear submarines. And especially the Kola Peninsula in northwest Russia has been very important because that has given Russia ice reports, which have been important for the strategic nuclear submarines to enter into the Barents Sea.

There has also been a lot of dumping in the Arctic, especially Barents Sea and the Kara Sea, but also in the Japanese Sea.

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In the 1990s, when Bellona started our work in northwest Russia, there was also a lot of focus on all of the laid-up submarines. There were about 70 to 80 nuclear submarines lying at shore, with the spent nuclear fuel inside; no plans for how to deal with the spent nuclear fuel. Run-down entities also included Chernobyl-type reactors; it was fairly accepted that none of these reactors could be upgraded to Western safety standards. There was a lot of dumped radioactive waste, submarine accidents, and also a large amount of legacy waste, especially in the west—the coastal naval base at Kola Peninsula.

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But during the two decades since the early 1990s, there have been a lot of improvements in the situation. The picture you see here is an RTG, which is a radioisotope thermoelectric generator using radioactive waste, which creates heat, and they use that heat to create electricity, which then can be used to power lighthouses and radio beacons in the Arctic. The Soviet Union manufactured about 2,000 of these sources. In Russia, nearly all of the reactors—RTGs placed in Russian territory, most of them in the Arctic—have now been replaced with solar panels. And RTGs have been shipped to storage in Siberia, in Mayak.

In northwest Russia, 120 nuclear submarines have been decommissioned and the spent nuclear fuel has been taken out. The spent fuel has been shipped to reprocessing in Mayak. And the bulk of the reactors have actually been brought onshore, at the Kola Peninsula. The dumping ended in 1994. And the safety for NPPs, the nuclear power plants, has been improved. But at the same time, they have prolonged the lifetime for those reactors, with some up to 30 years extra, but with maybe too little attention and too little focus on the safety upgrades. And, as I said, onshore compartments have been built.

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Today there are about 20 to 25 nuclear submarines, operating out in the Barents Sea, both strategic submarines but also multi-purpose attack submarines. And there is also, as we speak, being built eight new nuclear submarines in the shipyard in Severodvinsk, and one more will start being built in December. So the Russian navy is heavily focusing on building new submarines, new infrastructure, and on being much more present in the Arctic.

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Also, the Northern Sea Route put a lot of focus on the nuclear icebreaking capability in Russia. There are today five nuclear icebreakers in operation, and three more are being built. During recent years, there have been several fires, and also at least one incident of a coolant leak from one of these reactors onboard a nuclear icebreaker, showing that there is risk for accident also on the civilian naval fleet.

And the picture you see here shows plans for some gigantic icebreakers that the Russians are planning to build in a decade or two. And the rationale behind building all these new icebreakers is to export gas from the Arctic facilities in Yamal over to Asia. And, of course, the Northern Sea Route would be a much more effective way of transporting that gas instead of going all the way around Europe.

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But even though there has been a lot of work done, there is still a lot of remaining work. This picture shows the storage for the spent nuclear fuel from about 100 nuclear reactor cores in Andreeva Bay—40, 50 kilometers away from the Norwegian border.

There has been a lot of work done on infrastructure, building new cranes, new equipment, new roads, and new electricity at that facility. Next year they will be starting to remove that fuel from that facility. That work could also prove risky, because you see these tanks have been leaking water inside. Some of the fuel has been corroding, so a lot of this fuel is not possible to take out. It has not been possible to take them out for inspection, so we don't know what kind of condition this spent nuclear fuel is in.

What we fear is that when you start to pull the fuel element out of those compartments where they are stuck, that you could risk the bottom falling out of the cylinder and you get a lot of uranium and you could have a critical accident, which then could lead to radioactive release to the atmosphere. So that is three to four years coming now, which will be very critical in figuring out how to safely withdraw that fuel from Andreeva Bay. And also some of the old nuclear icebreakers are going to be dismantled, some of which contain a lot of nuclear material.

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Russia also dumped—or they don't call it “dumped,” they call it “stored”—especially when it comes to the reactor, they “store.” That is a way to treat reactors which have had a critical accident. So the reactors created radiation problems onshore, and then they made the decision to store them in the Kara Sea, close to Novaya Zemlya. And the depth of some of these reactors is only 40 meters deep, so it's technically easy to retrieve them if you have funding for that.

The main focus on the Russian side are now the K-27 and the K-159, which sank outside of Murmansk Fjord in 2003. The reason—especially the reason for K-27 is that it's buried under quite shallow water, 30 meters, and it also contains very highly enriched uranium. The Russian scientists say that if as little as eight liters of water comes into the reactor's core, then you could start a chain reaction, and that could start an uncontrolled heat production in that reactor. And it could then have such a massive explosion that you will expose the radioactivity inside the reactor to the air, and it could cause both contamination of the water but also contamination of the atmosphere. So that is one of the reasons why they are very focused on retrieving the K-27. But at the moment they don't have enough technical domestic capabilities to do that, and they're also lacking funding to do that. So they are trying to get countries like Norway to be a part of a funding proposal to lift those submarines.

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What are the potential threats to the Arctic? Of course, as I said, the nuclear icebreakers have recently had a lot of fires and coolant accidents, meaning that there could be more severe accidents onboard those. The Russian submarines have a long history of accidents and fire. Most famous is the Kursk in 2000. That could happen again, either with one of the old submarines they have in operation or with some of the new submarines they will put in operation quite soon.

There could also be leakage from the dumped material in the Kara Sea. About 90 percent of the radioactive material dumped is contained within seven of the reactors with the spent nuclear fuel, so it's fairly easy to recover 90 percent of the radioactive material by raising those. But, at the same time, that dumped material is dumped in the middle

of an area where there is a lot of oil and gas, and there have been many oil and gas expeditions to try to find new oil and gas fields. And, of course, if you have radioactive waste and you could either drill in one of the drums with radioactive waste or you could have some kind of accident, which then of course will make that kind of situation risky.

So even though there has been a lot of work done, like most of the submarines have been dismantled, there is still a lot of old legacy waste to be taken care of. And also there are new nuclear submarines and new nuclear icebreakers coming. So I think that for decades to come we will have a situation with a risk of Arctic pollution from Russian sources.

And I think that concludes my speech.

Mr. MASSARO. All right. Well, thank you very much, Nils, for that fascinating presentation.

I'd like now to give the floor to Julia. Thank you, Julia.

Ms. GOURLEY. Thank you, Paul. And thanks for inviting me here to talk to you about nuclear pollution in the Arctic. As you heard from Nils and from Paul, it's a topic with a rich history in the Arctic, but also in the Arctic Council, which is the body I work in and which the United States is chairing, as Paul mentioned.

My focus will be more on the environmental and health aspects of nuclear pollution in the Arctic. In fact, one of the working groups at the Arctic Council, called the Arctic Monitoring and Assessment Program, has, over the life of the Council, produced four successive scientific assessments of nuclear pollution in the Arctic. And its most recent one, concluding in 2015, was just released in published form earlier this year.

From a health perspective and an environmental perspective, the good news is that the levels of anthropogenic or manmade radioactivity in the Arctic attributable to identifiable releases is low, and it's generally declining, which means that the risks to human health are likewise decreasing. And the releases that I'm talking about here that AMAP looked at are atmospheric nuclear tests conducted in the 1950s and 1960s and the fallout resulting from that, nuclear fuel processing, historical dumping of radioactive waste—Nils was just talking about that—and, more recently, accidents at the Chernobyl and the Fukushima power plants.

The reduction in risk to health and the environment is predominantly due to the natural decay in the radionuclides. The half-lives are being reached in some cases. The natural decay is ongoing.

And just to repeat a little bit of what Nils just said, good progress has been made in Russia on several fronts that have reduced risks to human health and the environment, including the decommissioning of radioisotope thermoelectric generators, or RTGs; nuclear submarines, such as the Kursk, the nuclear-waste vessel Lepse, which was used for unloading and temporary storage of spent nuclear fuel from nuclear icebreakers between 1963 and 1981, and since 1981 it's been used as a floating storage unit for damaged spent nuclear fuel and solid and liquid radioactive wastes and related equipment. Its decommissioning has been a high priority for the Russian Government, and it's working toward that goal, which is a very good development; and, of course, the K-159 nuclear submarine that sank in 2003, that Nils also talked about, in the Barents Sea. As far as we know, there's no current leakage from the two reactors, although, of course, there is always concern about future leakage of highly enriched uranium and the conditions Nils was describing.

Russia is also managing and remediating temporary waste storage sites in Gremikha and Andreeva Bay on the Kola Peninsula, also that Nils talked about. In fact, nearly all

the spent nuclear fuel at the Gremikha facility has been removed, though the activity in Andreeva Bay is slow, and the same with the Mayak site, which I'm not even sure is under way yet, in northwestern Russia.

So that was sort of the good news, as good news can get, on the nuclear front in Russia. In terms of the areas of concern, there are still some, of course, very troubling things to think about that will require vigilant monitoring for the foreseeable future. For example, the Arctic remains vulnerable to radioactive pollution from distant sources. The Fukushima disaster a few years ago generated a small and thankfully insignificant uptick in background atmospheric radiation levels in the Arctic, but it certainly underscores the importance of vigilance and that nuclear accidents in far-flung parts of the world can certainly affect the Arctic. And radiation can disperse very, very, very far distances.

Another area of concern is related to legacy radioactive waste dumped in the Barents and Kara Seas, which could increase contamination levels in local Arctic waters if the drums deteriorate; highly dense sources of radioactivity from incomplete decommissioning of nuclear facilities and equipment and radioactive storage and substandard conditions in parts of the Arctic—parts of Russia—certainly continue to warrant long-term monitoring as well.

Interestingly—well, as everyone knows, there's a lot of oil and gas in the Arctic. Nils showed a map of some of the areas where Russia is exploring off Novaya Zemlya. Extraction activities themselves often result in what's called TENORM, or technologically enhanced, naturally occurring radioactive materials. And although the science suggests that the risks from TENORM associated with oil and gas extraction are negligible, it's the produced water from these industrial practices that warrant further study, especially given that offshore activities will certainly pick up again when the prices of oil and gas come down.

And parts of the Arctic are also rich in uranium deposits, especially in Canada and Greenland. And while there's no significant uranium mining and milling happening in those areas, if that changes, then, of course, the potential environmental and health impacts, including with respect to TENORM, will require more scientific study, because they're really not very well understood.

Then a new and sort of growing area of research is tied to—of all things—the effects of climate change on the remobilization of radioactivity in the Arctic, which happens mainly through changes in the hydrologic cycle, the water cycle, thawing permafrost and declining snow cover and wildfires, all of which can disrupt the landscape sufficiently to trigger releases of naturally occurring and anthropogenic, manmade, radioactivity sources.

So warming conditions in the Arctic could also release a significant amount of radon gas and associated radionuclides, which could, of course, be of concern to human health in local areas in Russia.

I wanted to also talk for a minute about other Arctic Council activity, other than the Arctic Monitoring Assessment Program's health assessment, which just came. The Council has six working groups, of which AMAP is one. Another one, called the Emergency Prevention Preparedness and Response, or EPPR, working group works on, among other things, accidental releases into the Arctic environment of pollutants in general, focusing in particular on chemical and, to a lesser extent, biological and naturally occurring pollutants.

Its focus right now is largely on oil-spill response in the marine environment because it's a more immediate concern, frankly, although we're having a pause in oil and gas development now, which is kind of allowing for a good opportunity to develop expertise in oil-spill response and other things like preparedness—prevention of oil spills and that sort of thing.

But EPPR also has deep expertise in radiological matters in the Arctic. And among its work products, it's developed projects to address gaps in the knowledge base, best-practice guidance, local emergency response plans, and risk-assessment methodologies for radiological accidents. It also has conducted actual tabletop exercises for radiological emergencies, training programs, and is focused in particular in Russia, because that's where, of course, the largest nuclear threat in the Arctic is.

Through EPPR, our head of delegation to that working group is the National Nuclear Security Administration. And NNSA has actually co-sponsored with Russia for many years a number of projects, including with Cooperative Threat Reduction funding, that include radiation exercises, radiological equipment upgrades, facility risk analyses, and site-specific information to aid first responders.

Another Arctic Council working group, called the Arctic Contaminants Action Program, or ACAP for short, focuses on pollution remediation in general. Its past work has included demonstration projects on the ground in Russia to mitigate things like black carbon, mercury, persistent organic pollutants, obsolete pesticides, and these RTGs, these radionuclide thermo-reactor generator things—long name. [Laughs.] RTGs for short.

And, of course, legacy hazardous waste in the Russian far east is something that we are concerned about in the Federal Government and in Alaska, because it's potentially problematic for Alaska. A lot of pollutants get into the environment. They can be transported, and there's not much space in the Bering Sea between the Russian far east and Alaska.

So EPA, which is our head of delegation to that working group, has invested small amounts of resources in pollution remediation just across the Bering Strait. They also at EPA led some work under the Cooperative Threat Reduction Program with Russia on spent nuclear fuel containment, and also worked with DOD on some projects under what was the Arctic Military Environmental Cooperation forum, or AMEC, which no longer exists, but was a useful sort of mil-to-mil forum for environmental cooperation between the U.S., Russia, Norway and the U.K.

I'll wrap up by noting that the effects of climate change in the Arctic extend to other pollutants than the ones that I talked about, and even to diseases. Earlier this year, Russia—some of you may have heard Russia experienced a mass die-off of reindeer in the Yamal Peninsula, which was directly a product of, or reaction to, thawing permafrost that exposed animal carcasses—reindeer carcasses—containing anthrax. And the local reindeer population on the peninsula became exposed. About 2,500 of them died. The anthrax then crossed into the human population, and 28 people were hospitalized for anthrax and one young boy died from it.

So there are certainly a lot of things that happen in the Arctic related to climate change that aren't completely in the headlines just yet. In fact, there are other graveyards on the permafrost throughout the Arctic, including Alaska and probably Canada and Greenland, that—you know, bodies that have been buried that contain other diseases like

smallpox and influenza and other diseases that could also potentially become exposed through thawing permafrost.

There are all kinds of incidents like this that can become, in a way, a greater immediate concern than radiation problems, to the extent that contained radioactive waste on the seabed doesn't become dislocated through oil and gas activities or earthquakes or whatever.

People don't really think about these kinds of consequences in rapidly warming Arctic conditions, but through the Arctic Council we are definitely focused on them and we'll continue to be focused on them, including environmental and scientific monitoring, for the foreseeable future.

Thank you.

Mr. MASSARO. Well, thank you very much, Julia. And what an anecdote on the end there. My goodness.

OK. Well, let me give the floor now to our last briefer, Jon Rahbek-Clemmensen. Jon, the floor is yours.

Mr. RAHBK-CLEMMENSEN. Thank you. And, first and foremost, thanks a lot for the invitation to speak here today about such a timely topic and to such a distinguished audience.

I'm going to say a little bit about the link between geopolitics and nuclear waste management. And I'm basically going to say three things. First I'm going to talk a little bit about what you would call the fundamentals of nuclear waste management. Then I'm going to talk a little bit about the geopolitics of the Arctic and Arctic cooperation as it is right now. And then I'm going to present two possible models for how you can expand nuclear waste governance in this region.

If you take the first point, what are the most fundamental dynamics of nuclear waste management? The first and most fundamental point, which I think the two previous speakers also highlighted, is that it's all about getting Russia onboard. It's in Russia that we see significant waste. It's in Russia that we have problems handling waste. And it's in Russia that we really have low-hanging fruit.

And if we look at the history of governance in this area, we see two things. We see that Russia has, on the one hand, been very unwilling to engage in cooperation with other nations when it comes to issues like this that are adjacent to defense and military affairs. But there has been some cooperation over the past 25 years. And Julia mentioned AMEC before, which I'll come back to again in a moment.

And I think the key to get Russia engaged in this area is funding. If the Western countries can come with funding for technology development, if Western countries can come with actual expertise, and if Western countries can implement action cleanups, then it's actually possible to engage Russia. And Russia has thus far actually been willing to cooperate in this area. So funding seems to be absolutely key.

Another necessary condition seems to be geopolitics. And it's no secret amongst any of us that in the past three years there's been some tension between Russia and the Western countries following the Ukraine crisis and the invasion of Crimea. The Arctic has been somewhat isolated from fallout from the Ukraine crisis. There has been a slight uptick in tensions. We've seen military exercises both by NATO, and especially by Russia, that's held a couple of fairly large flash exercises in the Barents Sea.

Russia has expanded its military infrastructure in the region, although one should hesitate to ascribe that to the Ukraine crisis, because I think most analysts would argue that Russia would have expanded its military infrastructure either way. But on the other hand, there has been a lot of cooperation in the region, especially when it comes to civilian and diplomatic areas. So a lot of the work in the Arctic Council more or less continues as it did before. The Arctic Council was able to create a very productive declaration in 2015 up in Iqaluit. The continental shelf process continues as it has thus far before the crisis.

So in that sense we see two tracks in Russia's policy. On the one hand, there are military tensions. There is a military buildup. But on the other hand, civilian and diplomatic cooperation continues.

We don't know the future of East-West cooperation, especially after the presidential election. And perhaps we are moving towards a rapprochement. Perhaps we are moving towards a new Russia reset, although I'm sure that they won't call it that. [Laughter.]

Basically, there are two models for how you can do nuclear waste management, and they more or less depend on the relationship between Russia and the United States. So I'll just go through them quickly.

There's one model for if U.S.–Russian relations improve, and there's one model if we continue the status quo. If we see improved relations between Washington and Moscow, it becomes possible to develop what we'd call an extensive separate program for nuclear waste governance, basically a revamp of AMEC, as we talked about before.

AMEC, the Arctic Military Environmental Cooperation, existed between 1996 and 2006-ish, and it consisted of Norway, the United States, and Russia and the United Kingdom for some part of the period. And it was a relatively successful cooperation that focused on these issues. They had some very concrete results. It was possible to invest heavily in containers for storage of spent naval fuels. It developed programs in waste processing technologies and radiation monitoring and a lot of other very concrete issues which I'm sure Nils knows a lot better than I do.

And there are basically two reasons why it was very successful. The first reason was that it engaged what you could call local stakeholders, especially Norway because Norway has a very big stake in nuclear waste management. I don't think it's a coincidence that Nils's foundation is located in Oslo. And it goes back to, like, if you look at the Norwegian economy, when you think about the Norwegian economy, normally you think about oil and gas. But actually, fishing makes up a fairly substantial part of Norway's economy. And if you do a lot of fishing in the Bering Sea, you do not want newspaper stories about nuclear waste in those seas; people do not want to eat radioactive fish. And Norway, therefore, became very engaged in AMEC, and Norway was able to engage various funds in Europe and in the Nordic countries, and generate significant funds and significant expertise for nuclear waste management. So that was the first thing, engage local stakeholders.

The second thing was that here in the U.S. it was possible to link nuclear waste management, which is, I guess, basically an environmental issue, with national security, especially strategic arms control and nonproliferation. AMEC became closely linked to the Nunn-Lugar Cooperative Threat Reduction and that created two advantages. First of all, it meant that it was possible to funnel funds from Nunn-Lugar to AMEC and use some of those funds to sponsor some of all these projects. And I can talk about why you can

make that connection and why nuclear waste management is important for strategic arms control. So that was one advantage, more funds.

The second advantage was that it was also possible to circumvent Russian restrictions. Russia can be kind of bureaucratic once in a while and it's—Norway at least experienced some problems with these projects when it came to importing different things to Russia. But the United States didn't have the same problem because the Nunn-Lugar whole cooperation system was made in a way where these restrictions couldn't apply, so that meant that Russia couldn't—the Russian bureaucracy had a hard time blocking all of these projects.

And in a more simple way, it was just easier to implement all of these projects in AMEC because there were fewer parties. Fewer parties means that it's easier to make decisions and it's easier to actually implement projects.

But, of course, there were some downsides to this extensive separate program model. It depends on a beneficial geopolitical environment. And as you all may know, the Ukraine crisis has closed down most strategic arms control with Russia. And that means that if we continue with the status quo, perhaps we have to look at a more humble or more narrow approach. And that will be basically what Julia just talked about, projects within the Arctic Council.

The Arctic Council, as I said before, has survived the Ukraine crisis, cooperation has continued, and the Arctic Council has a lot of existing programs that can be beefed up to engage with these issues. You have, as Julia said, the containment action program, the monitoring and assessment program and the protection of Arctic marine environment, and other working groups that already look at these issues. And they can just be used to—they can just be beefed up, basically.

Another option is to create a separate working group. These working groups are fairly easy to develop, but it's possible to create a new working group that could look specifically at nuclear waste management. And that approach has two advantages. It's possible to do during the Ukraine crisis, if the Ukraine crisis continues, and you don't have to invent a new framework, because the Arctic Council is an existing model. You can basically just plug and play into that model.

But there are, of course, a couple of downsides to that approach. It's more difficult to get funding. It's more difficult to make issue linkage, which is one of the key ways you generate funding. And especially because when it comes to—if projects are put under an Arctic Council umbrella, it cannot be linked to national security because the Arctic Council doesn't do security. And if you keep it in the Arctic Council, there will be more actors involved. The Arctic Council has eight members. It has a bunch of indigenous groups as members. And it has a bunch of observers as well, and governance is just a little bit more complicated. But yeah, that's the key takeaway.

It's possible to do something about nuclear waste management, even during the Ukraine crisis. If U.S.–Russian relations improve, you can do a more extensive, separate model, which would probably be more efficient. But even under the status quo, you can operate with a smaller model under the Arctic Council.

Mr. MASSARO. All right. Well, thank you very much, Jon.

I guess we'll move now to the Q&A section. I'll start off with two questions and then I'll open it to the floor for additional questions.

To begin, I guess this one is for anyone who would like to take the question. Has the United States made sufficient efforts to clean up our past issues with nuclear material in the Arctic and elsewhere, including nuclear submarines, the jettisoning of bombs, the Thule incident on Greenland, and any other related activity? Thank you.

Why don't we start with Nils?

Mr. BOHMER. Well, I'm not going to answer that question. No. But I just would like to emphasize that there has been a lot of discussion lately about the U.S. reactor at Greenland with the melting of the Greenland ice, and how are you guys going to solve that. And as far as I understand, it's a wait-and-see approach to that. I don't think that is a good approach. I think at least the funding, some be made available so that it's possible to do something with that reactor. So, it's not only Russia that has Arctic nuclear challenges there.

Mr. MASSARO. And with that we'll go to Julia or—[laughter]—

Ms. GOURLEY. Luckily I don't work at DOD. [Laughter.] I don't have much sight on that except I have heard the term—the place in Greenland is called Camp Century. And it is the subject of lively debate right now. And I am happily ignorant of it all.

But there's also, you know, there's also—we have the base at Thule, Greenland. And I think in the past there may have been some discovery of radiologicals in the ice underneath, so I think there might actually be some issues there as well. But DOD is dealing with it and I get to stay out of it. [Laughs.]

Mr. MASSARO. Jon?

Mr. RAHBK-CLEMMENSEN. I'll just chime in. For those of you who don't know the background: During the Cold War the U.S. built a base under the sea—under the ice in Greenland with a nuclear reactor, which is very cool and very “Star Wars”-y. [Laughter.] But it unfortunately didn't work, because apparently ice moves, and when the base was left, the thought was that, OK, these nuclear materials will be stored in the ice and, therefore, will be safe in the long term. And in the meantime, we've had climate change and now there's a big discussion about whether or not these nuclear materials will spill out and contaminate the environment.

And I would just add that solving that issue also plays into a very complicated triangular dynamic between the United States, Denmark and Greenland where there's a legacy of unfortunate incidents during the Cold War, which the autonomous government of Greenland holds against both the United States and Denmark. And it's a very complicated political environment to operate in. So, if the United States wants to flip the bill on this one, I'm pretty sure that the government in Copenhagen would be very happy.

Mr. MASSARO. Great. Well, thank you very much.

And let me move on to the next question there. I think we can assume that all countries react more positively to, say, the urging or pressure from particular countries or institutions or in particular fora depending on the country. So, with regard to Russia and with regard to the nuclear pollution issue that they're dealing with, what countries or institutions or fora do they react best to? Where's the best place to pursue this?

I guess we'll start up with Nils again and move down.

Mr. BOHMER. Well, how do you mean pursue? Do you mean by with funding or with technical questions or with how to—

Mr. MASSARO. Let me just say in general and leave it there.

Mr. BOHMER. OK. Well, OK, then I'll start with the funding and see how we go. There is some funding put aside in the EBRD, European Bank for Reconstruction and Development—there is a nuclear window there consisting of 150 million euros linked to the cleanup of the nuclear waste in the Arctic. And a lot of that will be going to deal with the waste in Andreeva Bay. So, I think that will be a good start, at least on the funding, because there is still a lack of funding. I think that it's lacking 700 or 800 million euros in order to clean out the Andreeva Bay. And you could argue that, well, this is something Russia should do. It has had a strong economy and they're, as you see, spending, building now eight to nine new nuclear submarines. Then they should also be doing that cleanup work themselves, they should afford that and prioritize that.

But I think also that the Arctic Council is a good way. There's no need to create another vehicle. We have the Arctic Council, I think that is a very good, good vehicle for the international agenda, but also the bilateral agenda. Norway, Russia has had very good cooperation on the nuclear issue also during the latest Crimea crisis, because Russia sees this as maybe soft policy and where they can cooperate with Norway. And Norway has their own interest, as I said, fisheries and also tourism are the two main income sources in Norway, so it's important to keep the Arctic, especially the Norwegian part of the Arctic, clean from radioactivity.

Mr. MASSARO. Right.

Mr. BOHMER. So they have their own interests there. So also the Norwegian Government could be a part of this agreement.

Mr. MASSARO. Either of you like to speak to that?

Mr. RAHBK-CLEMMENSEN. Yes.

Mr. MASSARO. Great.

Mr. RAHBK-CLEMMENSEN. Yes. Well, I'll just more or less second what Nils just said, that if I was the new Secretary of State, I would also go for an Arctic Council solution that just, in general, seems a lot more realistic. [Laughter.]

That being said, the tectonic plates of U.S. foreign policy seem to be moving right now. And I would just also flag that if there's going to be a rapprochement between Russia and the United States, then it would be possible that we could see a total change. In that case, it could be possible, as I said, to do something along the lines as AMEC. And that would not only be good for Arctic nuclear governance, but it would also—could also perhaps be a way for Russia and the United States to reengage one another in a fairly—on a concrete matter, which would help U.S.-Russian relations. And that's what I have.

Mr. MASSARO. Julia, you'd like to add something?

Ms. GOURLEY. Yes, I think I completely agree as well. And AMEC was quite a useful forum. I agree with both of you. And it was a safe topic. You know, working on environmental issues is fairly safe between—on a mil-to-mil basis between Russia and the U.S. And in fact, we, DOD and Norway, sort of tried to emulate AMEC a little bit through something called the Arctic Security Forces Roundtable, which is funded with defense, environmental international cooperation funding that DOD has called DEIC for short; defense, environmental international cooperation. The DEIC funding that was the basis for creating this Arctic security forces roundtable, which is the eight military—well, I sometimes say military—but the eight Arctic states plus the military engagement from—I think it's France, Germany, Netherlands and U.K.—is sort of an attempt to focus again on environmental issues mil-to-mil.

I don't think Russia is very excited about it, though, because Russia prefers to do all Arctic engagements among the eight, and in some cases among the five, coastal states. But I would also add that, as far as we understand from where we sit, we see, we hear that and observe, that Russia very much likes the BEAC, or Barents Euro-Arctic Council forum, and, maybe to a lesser extent, the Council of the Baltic Sea States as regional places to deal with Arctic issues as well. But I think the Arctic Council seems to be the favorite place for Russian engagement on Arctic issues with the other countries, including, in some cases, on nuclear issues.

Mr. MASSARO. All right, great. Thank you very much.

Let's go ahead and open the floor to questions. Do we have any questions?

All right, Scott. Jordan's going to bring you a mic.

QUESTIONER. Thank you. My name is Scott Cullinane, I work for the House Foreign Affairs Europe Subcommittee.

Nils, as you were describing the various possible ways that the stored nuclear waste could leak out or contaminate the environment, I'm curious if there's any real-time monitoring on that. If one of those scenarios you described began to happen, how long would it take for someone to notice it was happening?

Mr. BOHMER. Well, there are several real-time monitoring equipment on the Kola Peninsula. So, you would, in theory—they are, in theory, online. So, in theory, you would know quite as soon as it happens. But I think that those online monitoring facilities will be taken offline very soon by the Russian authorities.

Norway and Russia have an agreement on early warning on nuclear accidents; they have had that agreement for over 20 years, but it has never been used from the Russian side. They have now agreed on a new set of rules, ground rules, so that now Norway should be warned by Russia if any potential radioactive releases are coming.

A couple of years ago, there was a fire on a nuclear submarine in Murmansk, which the Russian authorities did acknowledge; they claimed that the fire was put out, but the fire continued for 20 hours after authorities said that it was put out. So I think that, no, we will not know. We will read it in the media or we will find rumors on Facebook before that happens.

And also, when it comes to the dumped material, which maybe has the most dramatic consequence if the water starts to leak into the reactors, there are no measurements there. There have been year-to-year Russian and sometimes Russian-Norwegian expeditions doing measurement around the wreck, making sure that there are no leakages out of that wreck, but there's no online measurement of that dumped material.

Mr. MASSARO. Julia, Jon, either of you like to add anything? OK, great. Thanks, Scott.

Do we have any other questions?

Alex?

Mr. TIERSKY. Thank you very much. Alex Tiersky, also with the Helsinki Commission.

As the global security and political-military affairs adviser at the Commission, I promise not to ask you the typical question about the frightening Russian military deployments in the region. I've heard the message that that is not a huge concern from some of you before.

What I would ask you is two words that I didn't hear from any of you specifically, which actually surprised me and that are in the security realm, that are directly related to this issue of nuclear waste, which is theft or diversion. And I'm wondering what the fora are for discussing concerns about theft or diversion.

I mean, I very carefully was looking at the pictures of Andreeva Bay. I'm not sure if I'm pronouncing it correctly. But it looks like a facility where you were talking about reactor cores as being stored, not a great deal of security. To what extent is this an issue? Is this an element of the discussion that you used to promote the cause of cleanup and proper storage of facilities?

And Julia, if I could ask you, is this a point of discussion in the Arctic Council specifically on theft and diversion? Thank you.

Mr. BOHMER. Well, I think that compared to what the situation was in the 1990s, the situation in northwest Russia has been much more improved when it comes to security issues or the risk of theft of nuclear material. It is much more difficult for me, for example, to get onto the nuclear bases than it used to be in the 1990s. I could more or less walk freely with no security and no security at all. I think, speaking about northwest Russia, I think that the material storage is much better guarded today than it was 10, 15 years ago because the FSB has much more power now and there is a lot of bend and a lot of, also with U.S. assistance, on safety and security operations around the bases.

There could be other areas in Siberia that are maybe less guarded where there has been less international attention. But I think northwest Russia is quite—it's relatively secure.

Mr. MASSARO. Yes?

Ms. GOURLEY. As to the Arctic Council, we actually don't discuss it there. And I don't really know why. I think because, the best answer I can give is that the structure of the Council has been so environmentally focused and not so much on security matters. That said, the only explicit exclusion from the Council's mandate is military security, so talking about national security, environmental security, health security kinds of issues are well within its mandate.

So, getting to Jon's point about the possible need for a new working group in the Arctic Council on nuclear security kinds of issues, that's actually something worth thinking about. That would be an obvious topic to take up.

Mr. MASSARO. Nothing to say on that one, Jon? All right, great.

Any other questions? A chance to get your name in the Congressional Record. All right.

Yeah, Mark, please? Jordan?

Mr. MILOSCH. Hi, my name is Mark Milosch and I'm the Chief of Staff at the Commission.

I'd like to pick up on the questions that Paul asked, which Paul and I talked about before, and maybe try to come at it from another angle or drill down a little further.

On Camp Century, what occurred to me while you were talking about that was, maybe that's actually helpful, if we wanted to approach the Russians about work that needs to be done in cleaning up a mess in the Arctic. If we have some work to do, too, maybe that sets it up in a more helpful way, where it's not you need to do X, but it's rather it's we need to do something. So, if you had any thoughts on that, I'd be interested.

But the bigger question would be on what's the best forum, organization? Part of thinking on that one was perhaps the U.S. is the worst figure to raise this issue because we're the ones who—if the United States shows up and says you have a lot of work to do in the Arctic, you know, we're the party they least want to hear that from. Maybe it comes better from some other country or in some kind of multilateral forum or from some kind of NGO. And at which point the question for us is, well, the Commissioners, Chairman would like to be constructively engaged on this. The Arctic Forum is really not a great one for our Helsinki Commission engagement or for our congressmen on the Commission to be engaged. So, any thoughts you have on that?

And I would just add to that that maybe the answer is that it works better if it's not framed as Arctic, but as the world's oceans. I mean, there are a number of times U.S. bombers were going down, they had to jettison bombs during the Cold War and they're at the bottom of the ocean today, or planes that went down, subs that—we didn't scuttle them as far as I understand—but they went down. Or maybe it's not framing it geographically more broadly, maybe it's framing it thematically more broadly as cleanup rather than nuclear.

Any thoughts you had on that would be helpful to us as Paul and I put our heads together, hopefully with you guys, and figuring out what would be a good way for the Chairman and Commission to be engaged on this.

Thank you.

Mr. BOHMER. If I may?

Mr. MASSARO. Go ahead, Nils.

Mr. BOHMER. No, I think maybe—I think your last comment was that we should maybe focus away from the Arctic and maybe have a more global approach. I think legacy waste is a very good expression, because you have legacy waste in Hanford, you have it in Sellafield in the U.K., you have it—a lot of it in Mayak.

I think there has been a lot of focus, there has been a lot of work going on there. But I think that the legacy waste generally, a broader term, there is a lot of work to be done, both here in the U.S., also in the U.K., also in Russia.

And I think also, coming back to AMEC, I think one of the good things or the reason for the success was that it was trilateral. You had Russia, U.S. and tiny, little, innocent Norway as a third part. And I think that also made sure that we could be this kind of go-between guy now between Russia and the United States. And I think that that is also a good way forward.

For example, in the center, maybe Denmark could be this kind of—or maybe they are too heavily invested. Or maybe Norway should—but there, I think it also would be good if the U.S. put a bit more effort in cleaning up in the Arctic, whereas they also have some RTGs in Alaska in the Arctic that could be dealt with, but yes.

Mr. MASSARO. Any other thoughts?

Jon?

Mr. RAHBK-CLEMMENSEN. Yes, well, I'd like to say something about that because I think, actually, I think it's a really good idea. I normally I leave the diplomatic tactics to the people who actually do it, people like Julia. But I think you're quite right that if it can be framed as a project that's not, as you say, finger-wagging against Russia, then you have a better chance of actually doing something productive and constructive in that regard. I think that part of your question was actually quite brilliant.

Regarding the second half of your question, would it be better if we didn't talk about nuclear waste as an Arctic problem, but as a global problem? If I was being devil's advocate, I would raise one concern. Whenever you have an Arctic issue, whenever someone begins to talk about the Arctic as a global issue, the alarm bells go off in Moscow and in Oslo and in Copenhagen, because these states—and in Ottawa as well—because these states really like to keep it as an exclusive club. And their biggest fear is that somehow the Arctic becomes a global issue, someone comes and takes the responsibility and the power to do things about the Arctic away from them and puts it in the U.N. or something. The greatest fear is an Arctic treaty.

So, I think it's a good idea, but I would raise that there would be a lot of legwork in it to convince a lot of these Arctic countries that perhaps this is not an attempt to take away their power.

Mr. MASSARO. Excellent, thank you so much.

Other questions? OK.

Let me just ask a very short, very standard sort of follow-up question, and that's, you know, you guys have given us these great presentations today, lots to think about and lots of thoughts and recommendations, too. What would be the number one or top three things that the United States Congress should be doing right now on this issue?

Julia?

Ms. GOURLEY. Well, certainly funding the or providing or reinvigorating the—

Mr. MASSARO. Money, right? [Laughter.]

Ms. GOURLEY. Cooperative Threat Reduction program and encouraging the reinvigoration also of the AMEC forum. And the mil-to-mil cooperation, which is largely dead now, at least between Russia and the U.S., and I think all the allies and Russia, which is certainly the way it has to be. But finding these noncontroversial areas, you know, as we've done in the Arctic Council. We've been able to sort of carve it out in a way, I mean, not entirely away from the Ukraine issues, and certainly if things happen and go south on that front, all bets may be off for the Arctic Council, too, but finding ways to get mil-to-mil cooperation back on track in areas that are nonthreatening and maybe not so controversial would seem like a number two after funding for various things like the Cooperative Threat Reduction program would be good places to start, I think, for Congress.

Mr. MASSARO. Any other thoughts?

Mr. RAHBK-CLEMMENSEN. Yes. I'm not an expert on congressional politics. [Laughter.] But I think that this could be an area where perhaps a new administration doesn't really have a set agenda and where it's actually possible to move something and move some thinking in the State Department and in the White House. And I think that would be my takeaway, that and more money, of course.

Mr. MASSARO. Nils?

Mr. BOHMER. Well, I agree. And I think this important if you call it the Trump restart or whatever you think—[laughter]—no, but I think there's a need for dialogue between Russia or Moscow and Washington on military issues. And if you can have some sort of military-environmental cleanup project, that could be this kind of soft project that could start up this dialogue. Because I think that dialogue has been very closed these couple of years. So, any project that makes this bilateral dialogue better would be very good.

And I think doing this environmental project is easier to do than arms reduction. Yeah.

Mr. MASSARO. Well, great. If there are no more questions, all right, I'd like to thank our briefers one more time. Great presentations, great answers.

Jon, very funny, "Star Wars."

And let me also thank Jordan Warlick, intern at the Helsinki Commission, who basically pulled this whole thing together. Thank you very much, Jordan.

And with that, the briefing is concluded.

Thank you. [Applause.]

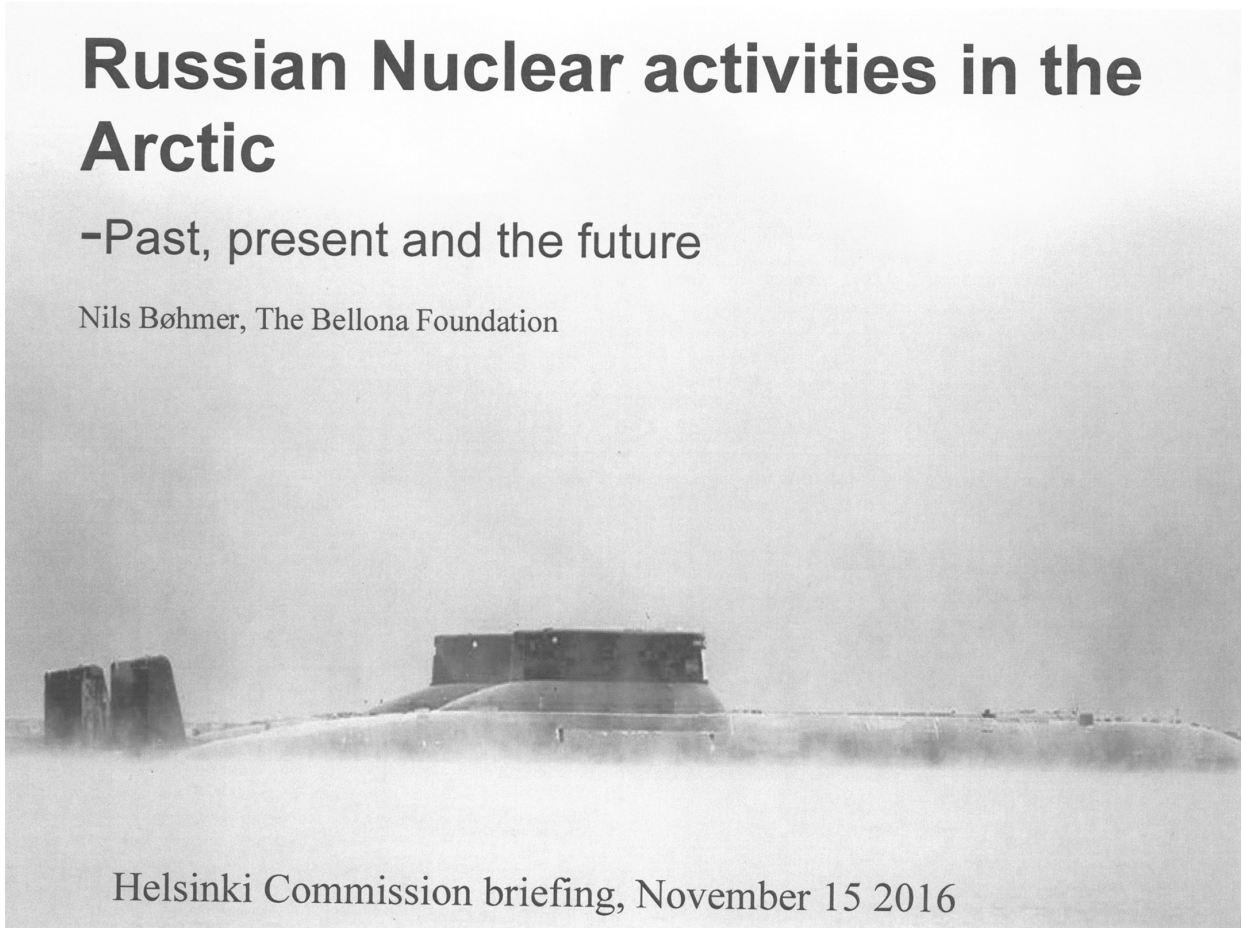
[Whereupon, at 4:37 p.m., the briefing ended.]

SLIDE PRESENTATION BY NILS BOHMER


Russian Nuclear activities in the Arctic

-Past, present and the future

Nils Bøhmer, The Bellona Foundation



Helsinki Commission briefing, November 15 2016

- Environmental NGO with organizations in Norway, Belgium and Russia
 - Worked with Russia since late 1980's
 - Office in Murmansk since 1994, and later St. Petersburg
 - Important to be on the ground in Russia
 - Several reports about nuclear challenges in Russia
- 

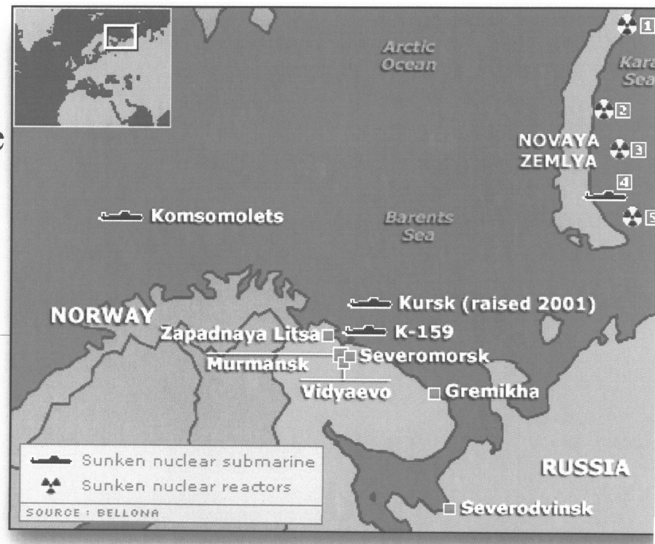
Russian Nuclear Activity

- 10 NPPs, uranium mining and production of nuclear fuel
- Nuclear icebreakers and floating NPPs
- Nuclear weapons, nuclear submarines and legacy waste



Russia in the 1990s

- Laid up submarines
- Run down NPPs
- Dumping of radioactive waste
- Submarines accidents
- Legacy waste



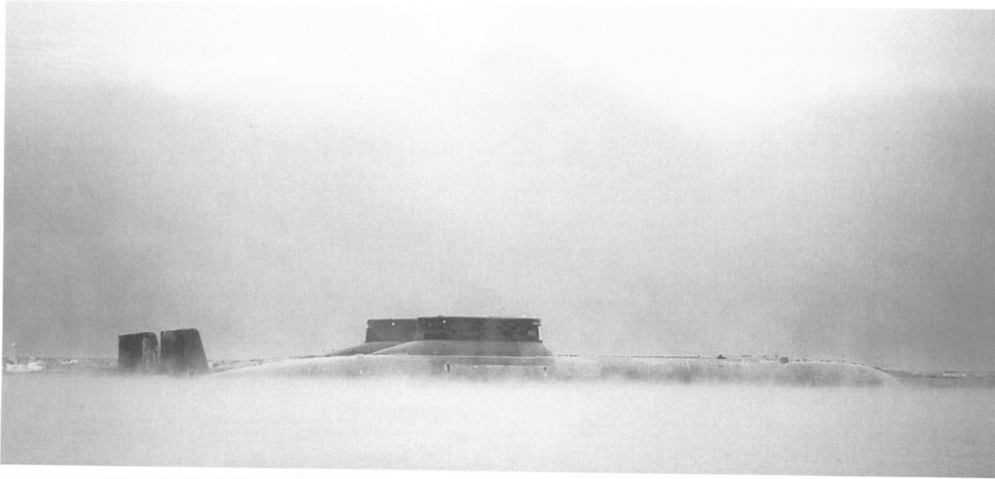
Improvements since 1990s

- RTG's replaced with solar panels
- All 120 nuclear submarines decommissioned
- Dumping ended
- Safety for NPPs improved, but lifetime prolonged
- On-shore facility for reactor compartments



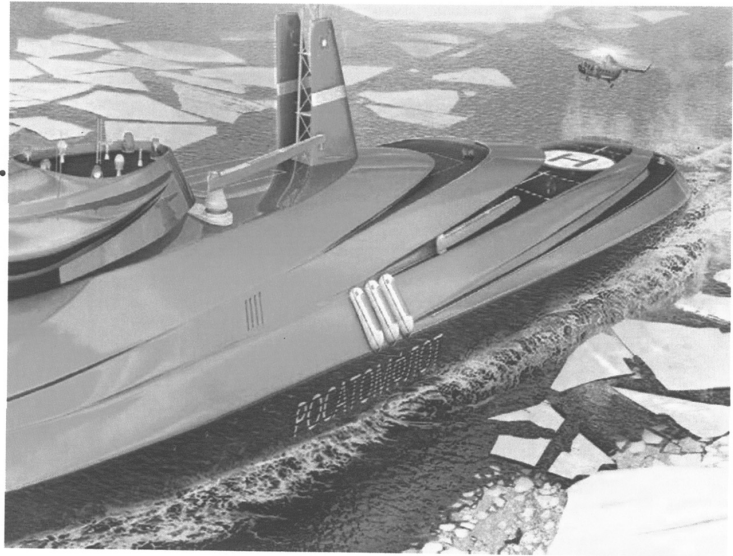
Nuclear submarines today

- ~25 nuclear submarines in service
- 8 new nuclear submarines under construction



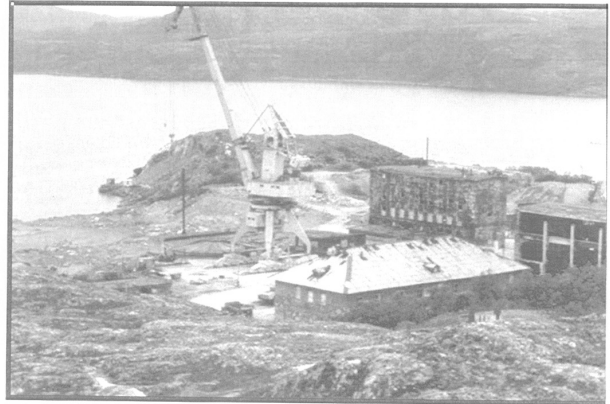
Nuclear icebreakers

- 5 in service
- Several fires and coolant leak recent years
- 3 under construction
- Plans for giant icebreakers



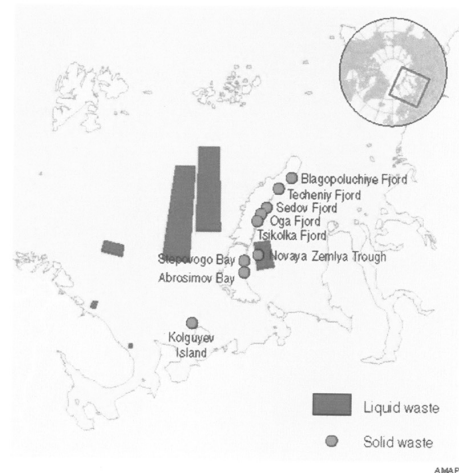
Remaining work

- Remove SNF from 100 reactor cores from storage at Andreeva bay
- Dismantle nuclear icebreakers and service ships



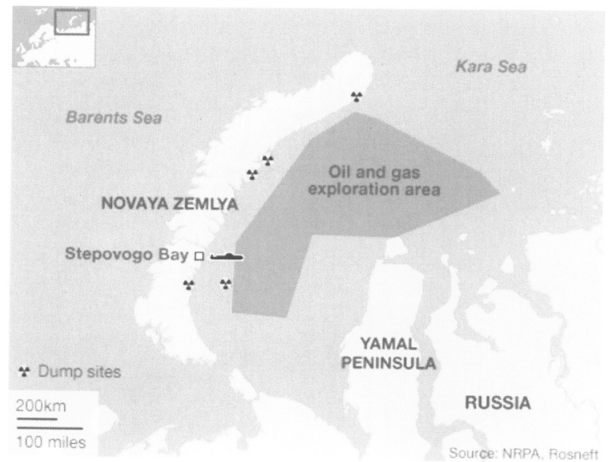
Dumped material

- 17,000 RW containers
- 19 ships with RW
- 14 reactors "stored"
- Focus on recovery of the submarines K-27 and K-159



Arctic threats

- Accidents nuclear vessel
- Leaks from dumped material
- Conflict with oil and gas activity in the Kara Sea



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